



United States Department of the Interior  
FISH AND WILDLIFE SERVICE  
3761 GEORGETOWN ROAD  
FRANKFORT, KY 40601

March 25, 2003

Ms. Annette Coffey  
Division of Planning  
Kentucky Transportation Cabinet  
125 Holmes Street  
Frankfort, Kentucky 40622

Subject: FWS #03-0881; I-66 Scoping Study and Bowling Green Eastern Outer Beltline  
Scoping Study, Warren and Edmonson Counties, Kentucky.  
KTC Item No. 03-66.00 - Bowling Green I-66  
KTC Item No. 03-103.00 - Bowling Green Outer Beltline

Dear Ms. Coffey:

Thank you for your correspondence of February 11, 2003, regarding the Kentucky Transportation Cabinet's (KTC) I-66 Scoping Study and Bowling Green Eastern outer Beltline Scoping Study in Warren and Edmonson Counties, Kentucky. KTC is evaluating alternate freeway corridors for the Southern Kentucky Corridor (I-66) from the Louis B. Nunn Parkway (Cumberland Parkway) to the Natchez Parkway, and the Bowling Green Eastern Outer Beltline from I-65 south of Bowling Green eastward and around Bowling Green to I-65 and then northwest to Natchez Parkway. Fish and Wildlife Service (Service) personnel have reviewed the information submitted, and we offer the following comments.

You had requested information on critical habitat areas that were in the vicinity of the study area. Two critical habitat areas exist in the vicinity of the proposed project area in Edmonson County and are listed below:

<u>Common Name</u>	<u>Scientific Name</u>	<u>Federal Status</u>	<u>Critical Habitat</u>
Indiana bat	<i>Myotis sodalis</i>	endangered	Coach Cave
Kentucky cave shrimp	<i>Paracamonius ganvari</i>	endangered	Mammoth Cave

Attached is a map showing the general locations of the caves in relation to the study area. Additional information on critical habitat for these species is available on the Service's national website at [www.fws.gov](http://www.fws.gov).

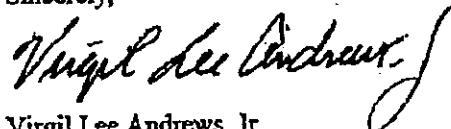
In addition, several endangered and/or threatened species are known to occur within the proposed study area.

- Gray bats have been collected between corridors 2 and 4/5 near B-2 cave and in corridor 23 in Son of Finney Cave. Also, there are several gray bat and Indiana bat records just northeast of the study area. A record for the Indiana bat and gray bat exists within the eastern portion of corridor 4/5 near Crump Cave. Known records for gray bats also exist just south of corridor 23. These two listed bat species are likely to use caves, tunnels, bridge overpasses, and other suitable roosting structures within the proposed highway corridors.
- Eggert's sunflower occurs between corridor 10/11/12 and corridor 4/5 east of corridor 10/11. Also, there are records for Eggert's sunflower just northeast of the study area. This species often inhabits disturbed or other artificially-maintained areas and is often found adjacent to existing roadways.
- Several listed freshwater mussel species occur in the Barren River west of the study area and within corridors 5/11 and 12 and south of corridor 23. These species rely on flowing streams with good water quality in order to survive.
- A record for the Kentucky cave shrimp exists east of the study area in the Turnhole Spring Basin area and also north east of corridor 2 near the Double Sink Basin area. This species is known to inhabit the underground aquifer system associated with Mammoth Cave National Park.

Once you have identified the final locations of the proposed roads, you should survey potential habitats for the species listed above. Your efforts to minimize direct and indirect impacts to these species during the highway planning process is greatly appreciated.

Thank you for the opportunity to provide the requested information. If you have any questions regarding the information which we have provided or if you need additional information on the species that occur in the vicinity of the study area, please contact me at (502) 695-0468 (ext. 221) or Mindi Brady at (502) 695-0468 (ext. 229).

Sincerely,



Virgil Lee Andrews, Jr.  
Field Supervisor

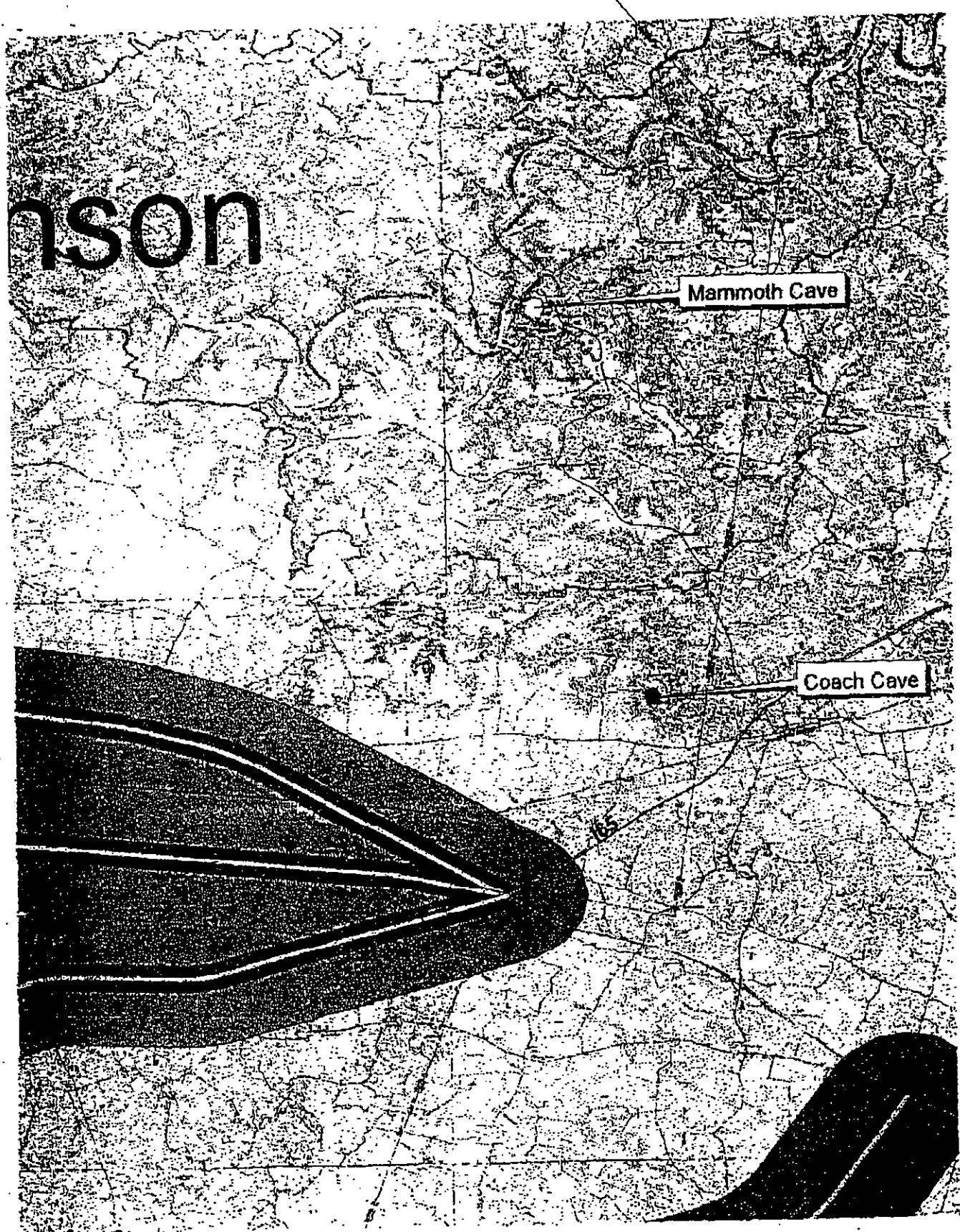
xc: Lee Barclay, FWS, Cookeville, TN

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COOKEVILLE FWS

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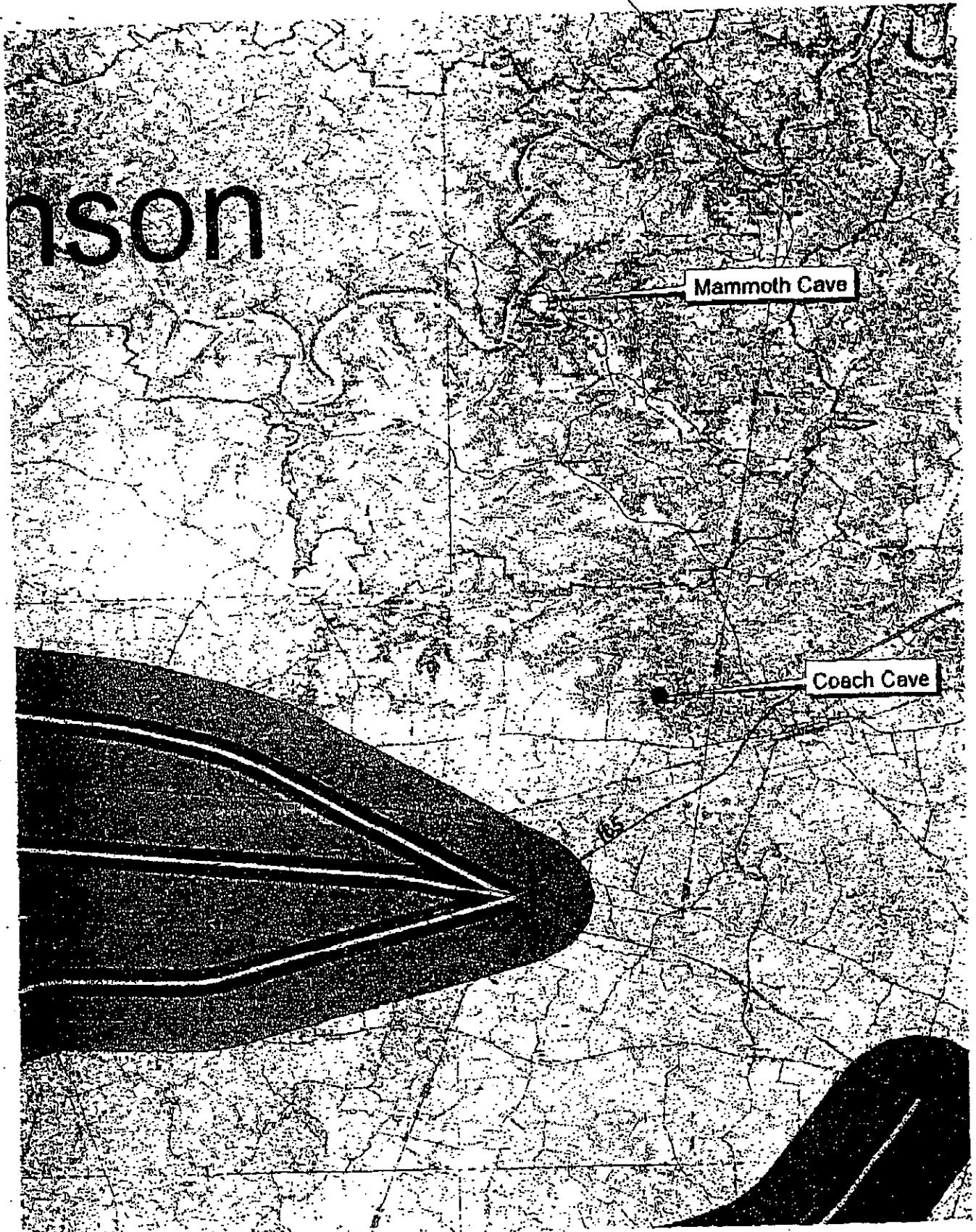


Apr 05 04 02:11p

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# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
3761 GEORGETOWN ROAD  
FRANKFORT, KY 40601

April 14, 2004

Mr. Rusty Yeager  
Bernardin, Lochmueller & Associates, Inc.  
6200 Vogel Road  
Evansville, Indiana 47715-4006

Subject: FWS #04-0590; Transpark Connector Rd/Intersection I-65 to US 31W,  
Warren County, Kentucky  
KTC Item No. 03-0016.00

Dear Mr. Yeager:

Thank you for your correspondence of February 16, 2004, regarding the Kentucky Transportation Cabinet's (KTC) proposed construction of the Transpark Connector Road and Intersection in Warren County, Kentucky. Fish and Wildlife Service (Service) personnel have reviewed the information submitted and the following comments are provided in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*) and the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

In general, we are concerned that highway projects frequently accelerate erosion and sedimentation in streams, resulting in adverse effects to the aquatic environment. The use of heavy equipment to move earth and existing vegetation disrupts natural drainage patterns and exposes large areas of disturbed soil to erosion. Excessive sedimentation can clog stream channels and contribute to increased flooding. It can also increase water temperatures and cause oxygen demands that can damage or destroy fish and invertebrate populations. Deposition of sediment on the channel bottom also degrades aquatic habitat by filling in substrate cavities, burying demersal eggs, and smothering bottom organisms. In addition, turbidity, as induced by accelerated erosion and sedimentation, results in further damage to aquatic systems. Increased particulate matter suspended in the water column may drive fish from the polluted area by irritating the gills, concealing forage, and/or destroying vegetation that may be essential for spawning and cover habitat for particular species. Turbidity also degrades water quality by reducing light penetration, pH and oxygen levels, and the buffering capacity of the water. Degraded water quality may continue far downstream from the point where the erosion occurs.

Prevention of excessive sedimentation can occur only through application of Best Management Practices during daily construction activities. Rigid application of your agency's construction erosion control standards can preclude most sedimentation problems. In some cases, however, additional measures will need to be taken by on-site inspectors and construction representatives

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that are trained in erosion and sediment control methods. We request that you consider having an inspector on-site during all construction activities to ensure that work areas are stabilized on a daily or regular basis.

According to our records, several federally listed species may occur in the vicinity of the proposed project area in Warren County. We have attached a copy of our March 25, 2003, letter on the I-66 Scoping Study and Bowling Green Outer Beltline, which contains specific information on the locations of these federally listed species. However, based on the information that we were provided on this proposed project, only three of these species may be affected by the proposed project. These three species are listed below:

<u>Common Name</u>	<u>Scientific Name</u>	<u>Federal Status</u>
Eggert's sunflower	<i>Helianthus eggertii</i>	threatened
Indiana bat	<i>Myotis sodalis</i>	endangered
gray bat	<i>Myotis grisescens</i>	endangered

The federally threatened Eggert's sunflower (*Helianthus eggertii*) is known to occur in the vicinity of the project site. Eggert's sunflower occurs in barrens and woodland ecosystems where a mix of grassy, treeless openings lies within a thin overstory of small to medium sized trees, usually oaks. The KTC should survey the project areas to determine the presence or absence of this species within the project area in an effort to determine if potential impacts to this species are likely. A qualified botanist, and preferably one who holds the appropriate collection permits for this species, must undertake such surveys, and we would appreciate the opportunity to approve the biologist's survey plan prior to the survey being undertaken and to review all survey results, both positive and negative. If this species is identified, we request written notification of such occurrence(s) and further coordination and consultation with you.

According to our records, summer roost habitat and or winter roost habitat for the endangered Indiana bat (*Myotis sodalis*) and the endangered gray bat (*Myotis grisescens*) may exist within the proposed project site. Based on this information, we believe that: (1) forested areas in the vicinity of and on the project area may provide potentially suitable summer roosting and foraging habitat for the Indiana bat and potentially suitable foraging habitat for the gray bat (if suitable roosting sites are present); and (2) caves, rockshelters, and abandoned underground mines in the vicinity of and on the project area may provide potentially suitable winter hibernacula habitat for the Indiana bat and/or potentially suitable summer roosting and winter hibernacula habitat for the gray bat. Our belief that potentially suitable habitat may be present, and possibly occupied by one or both of these species, is based on the information provided in your correspondence, the fact that much of the project site and surrounding areas contain forested habitats that are within the natural ranges of these species, and our knowledge of the life history characteristics of these species.

The Indiana bat utilizes a wide array of forested habitats, including riparian forests, bottomlands, and uplands for both summer foraging and roosting habitat. Indiana bats typically roost under exfoliating bark, in cavities of dead and live trees, and in snags (i.e., dead trees or dead portions of live trees). Trees in excess of 16 inches diameter at breast height (DBH) are considered optimal for maternity colony roosts, but trees in excess of 9 inches DBH appear to provide

suitable maternity roosting habitat. Male Indiana bats have been observed roosting in trees as small as 3 inches DBH.

Prior to hibernation, Indiana bats utilize the forest habitat around the hibernacula, where they feed and roost until temperatures drop to a point that forces them into hibernation. This "swarming" period lasts, depending on weather conditions in a particular year, from about September 15 to about November 15. This is a critical time for Indiana bats, since they are acquiring additional fat reserves and mating prior to hibernation. Research has shown that bats exhibiting this "swarming" behavior will range up to five miles from chosen hibernacula during this time. For hibernation, the Indiana bat prefers limestone caves, sandstone rockshelters, and abandoned underground mines with stable temperatures of 39 to 46 degrees F and humidity above 74 percent but below saturation.

Gray bats roost, breed, rear young, and hibernate in caves year round. They migrate between summer and winter caves and will use transient or stopover caves along the way. For hibernation, the roost site must have an average temperature of 42 to 52 degrees F. Most of the caves used by gray bats for hibernation have deep vertical passages with large rooms that function as cold air traps. Summer caves must be warm, between 57 and 77 degrees F, or have small rooms or domes that can trap the body heat of roosting bats. Summer caves are normally located close to rivers or lakes where the bats feed. Gray bats have been known to fly as far as 12 miles from their colony to feed.

Because we have concerns relating to these species on this project and due to the lack of occurrence information available on these species relative to the proposed project area, we have the following recommendations relative to Indiana bats and gray bats.

1. Based on the presence of numerous caves, rockshelters, and underground mines in the vicinity of the project area, we believe that it is reasonable to assume that other caves, rockshelters, and/or abandoned underground mines may occur within the project area, and, if they occur, they could provide winter habitat for Indiana bats and/or summer and winter habitat for the gray bat. Therefore, we recommend that you survey the project area for caves, rockshelters, and underground mines, identify any such habitats that may exist on-site, and avoid impacts to those sites pending an analysis of their suitability as Indiana bat habitat by this office.
2. We also recommend that you only remove trees within the project area between October 15 and March 31 in order to avoid impacting summer roosting Indiana bats. However, if any Indiana bat hibernacula are identified on the project area or are known to occur within 10 miles of the project area, we recommend you only remove trees between November 15 and March 31 in order to avoid impacting Indiana bat "swarming" behavior.

We request your written acceptance of these recommendations as project conditions. However, if these recommendations cannot be incorporated as project conditions, then you should survey

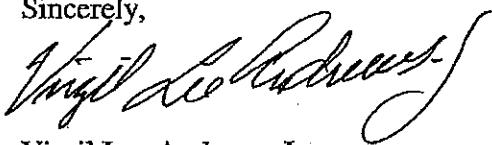
the project area to determine the presence or absence of these species within the project area in an effort to determine if potential impacts to these species are likely. A qualified biologist who holds the appropriate collection permits for these species must undertake such surveys, and we would appreciate the opportunity to approve the biologist's survey plan prior to the survey being undertaken and to review all survey results, both positive and negative. If any Indiana bats and/or gray bats are identified, we request written notification of such occurrence(s) and further coordination and consultation with you.

Surveys would not be necessary if sufficient site-specific information was available that showed: (1) that there is no potentially suitable habitat within the project area or its vicinity or (2) that the species would not be present within the project area or its vicinity due to site-specific factors. Please provide us with a written explanation or justification if either or both of these would apply to the proposed project.

In addition, there are two areas that have designated as critical habitat for federally listed species in the vicinity of the proposed project. One of these areas is Coach Cave in Edmonson County, which is designated critical habitat for the Indiana bat. The other area is Mammoth Cave, which is designated critical habitat for the endangered Kentucky cave shrimp (*Palaemonias ganteri*). Although neither of these critical habitat areas is located within the immediate project vicinity, the KTC should evaluate the potential direct and indirect effects, if any, of the proposed project on these critical habitats, the Indiana bat, and Kentucky cave shrimp and provide us with the analysis prior to implementation of the proposed project.

Thank you for the opportunity to comment on this proposed action. If you have any questions regarding the information we provided, please contact Mindi Brady at (502)/695-0468 (ext.229).

Sincerely,



Virgil Lee Andrews, Jr.  
Field Supervisor



KENTUCKY STATE NATURE PRESERVES COMMISSION  
801 SCHENKEL LANE, FRANKFORT, KY 40601-1403  
PHONE: 502-573-2886 - FAX: 502-573-2355  
[www.kynaturepreserves.org](http://www.kynaturepreserves.org)  
[nrepc.ksnpeemail@mail.state.ky.us](mailto:nrepc.ksnpeemail@mail.state.ky.us)

March 1, 2004

Rusty Yeager  
Bernardin, Lochmueller and Associates, Inc.  
6200 Vogel Road  
Evansville, IN 47715

Data Request 04-104

Dear Mr. Yeager:

This letter is in response to your data request of February 9, 2004 for the I-65/US31W Connector East of Bowling Green project. We have reviewed our Natural Heritage Program Database to determine if any of the endangered, threatened, or special concern plants and animals or exemplary natural communities monitored by the Kentucky State Nature Preserves Commission occur near the project area as described in your request on the Bristow and Smith's Grove USGS quadrangles. Based on our most current information, we have determined that forty-nine occurrences of the plants or animals and one occurrences of the exemplary natural communities that are monitored by KSNPC are reported as occurring within a 5-mile radius of the specified area. Please see the attached report for more information.

*Palaemonias ganteri* (Mammoth Cave shrimp, federally listed endangered, KSNPC endangered) is known to occur within 10 miles of the project site. There are several other KSNPC-monitored cave obligate organisms that occur in the subterranean habitats common to this area. The site is located within a karst landscape characterized by numerous sinkholes, underground conduits, or caves. Construction disturbance or release of pollutants within the specified area could easily cause contamination of groundwater many miles from the original disturbance. Caves are often associated with sensitive ecosystems and may provide habitat for a number of rare or endangered species. Cave organisms are heavily dependent on water quality, and steps should be taken to avoid introducing contaminants into the water system.

*Helianthus eggeri* (Eggert's sunflower, federally listed threatened, KSNPC threatened) is a species that occurs within the search area. Eggert's sunflower occurs in the Interior Low Plateau region of Kentucky. Typical habitat for this species includes barrens, open Oak-Hickory woodlands,



forest edges, rocky hillsides, and roadside remnants of these habitats. A thorough search by a qualified biologist of the above habitat types during the flowering period is recommended before any activity that may cause disturbance occurs.

*Myotis sodalis* (Indiana bat, federally listed endangered, KSNPC endangered) and *Myotis griseescens* (Gray bat, federally listed endangered, KSNPC endangered) are known to occur within the 5-mile radius of this project. A thorough survey for this species should be conducted by a qualified biologist if suitable habitat will be disturbed. The survey should include a search for potential roost and winter sites, and a mistnetting census at numerous points within the proposed corridor, particularly in preferred summer habitat. Summer foraging habitats include upland forests, bottomland forests and riparian corridors. Suitable roost and winter sites include sandstone and limestone caves, rockhouses, clifflines, auger holes, and abandoned mines. In order to avoid impacts to bats, bottomland forests and riparian corridors, particularly near caves, should not be disturbed.

Your project area is within the boundaries of an area known as the Green River Bioreserve, a system of surface and subterranean aquatic habitats comprising the recharge area of the Green River and associated Mammoth Cave systems. This is the fourth-most important site nationally for the conservation of rare aquatic organisms and biodiversity. It includes the largest number of imperiled aquatic organisms in Kentucky. Federal, state, private entities, and the public are working together to protect this important area. The following freshwater mussels are known to inhabit the streams that could be impacted by this project:

*Alasmidonta marginata* (Elktoe, KSNPC threatened)  
*Cyprogenia stegaria* (Fanshell, federally listed endangered, KSNPC endangered)  
*Epioblasma obliquata obliquata* (Catspaw, federally listed endangered, KSNPC endangered)  
*Epioblasma torulosa rangiana* (Northern Riffleshell, federally listed endangered, KSNPC endangered)  
*Epioblasma triquetra* (Snuffbox, KSNPC endangered)  
*Fusconia subrotunda subrotunda* (Longsolid, KSNPC Special Concern)  
*Lampsilis ovata* (Pocketbook, KSNPC endangered)  
*Plethobasus cyphyus* (Sheepnose, KSNPC Special Concern)  
*Pleurobema clava* (Clubshell, federally listed endangered, KSNPC endangered)  
*Pleurobema plenum* (Rough pigtoe, federally listed endangered, KSNPC endangered)  
*Quadrula cylindrica cylindrica* (Rabbitfoot, KSNPC threatened)  
*Simpsonaias ambigua* (Salamander mussel, KSNPC threatened)  
*Toxolasma lividus* (Purple lilliput, KSNPC endangered)  
*Villosa lienosa* (Little spectaclecase, KSNPC special concern)  
*Villosa ortmanni* (Kentucky creekshell, KSNPC threatened)



March 1, 2004

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Aquatic species and habitats in the area are sensitive to increased turbidity, sediment, and other adverse influences on water quality. A written erosion control plan should be developed that includes stringent erosion control methods (i.e., straw bales, silt fences and erosion mats, immediate seeding and mulching of disturbed areas), which are placed in a staggered manner to provide several stages of control. All erosion control measures should be monitored periodically to ensure that they are functioning as planned. Our data are not sufficient to guarantee absence of endangered, threatened or sensitive species from the sites of proposed construction disturbance. We recommend that impacted streams be thoroughly surveyed by a qualified biologist prior to any in-stream disturbance.

I would like to take this opportunity to remind you of the terms of the data request license, which you agreed upon in order to submit your request. The license agreement states "Data and data products received from the Kentucky State Nature Preserves Commission, including any portion thereof, may not be reproduced in any form or by any means without the express written authorization of the Kentucky State Nature Preserves Commission." The exact location of plants, animals, and natural communities, if released by the Kentucky State Nature Preserves Commission, may not be released in any document or correspondence. These products are provided on a temporary basis for the express project (described above) of the requester, and may not be redistributed, resold or copied without the written permission of the Kentucky State Nature Preserves Commission's Data Manager (801 Schenkel Lane, Frankfort, KY, 40601. Phone: (502) 573-2886).

Please note that the quantity and quality of data collected by the Kentucky Natural Heritage Program are dependent on the research and observations of many individuals and organizations. In most cases, this information is not the result of comprehensive or site-specific field surveys; many natural areas in Kentucky have never been thoroughly surveyed, and new plants and animals are still being discovered. For these reasons, the Kentucky Natural Heritage Program cannot provide a definitive statement on the presence, absence, or condition of biological elements in any part of Kentucky. Heritage reports summarize the existing information known to the Kentucky Natural Heritage Program at the time of the request regarding the biological elements or locations in question. They should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. We would greatly appreciate receiving any pertinent information obtained as a result of on-site surveys.



Data Request 04-104

March 1, 2004

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If you have any questions or if I can be of further assistance, please do not hesitate to contact me.

Sincerely,

Sara Hines  
Data Manager

SLD/SGH

Enclosures: Data Report and Interpretation Key



**Vascular Plants**

EPCODE	SNAME	SCOMNAME	RANK	SPROT	USES&	REC	LASTOBS	PERC	ORRANK	COUNTY	7.5 MINUTE QUADRANGLE	LAT	LONG	EPA WATERBODY	DIRECTIONS	HABITAT	
<b>Vascular Plants</b>																	
PDRAN0B0C0*020	<i>Delphinium carolinianum</i>	Carolina Larkspur	GS	S1S2	T	Y	2001-06-01	S	D	Warren	Bowling Green North	370332N	0862241W	0511002190 - Barren River Lake	EAST SIDE OF PLUM SPRINGS RD (MT OLIVET CHURCH RD), 0.6 RD MIN OF JCT KY 526.	DRY WOODS, PRAIRIES, SANDHILLS (GLEASON & CRONQUIST 1990); EDGES OF CEDAR GLADES.	
PDAST4NJO*016	<i>Helianthus eggertii</i>	Eggert's Sunflower	G3	S2	T	LT	Y	2000-09-08	S	B	Warren	Bristow	370208N	0861642W	0511002190 - Barren River Lake	ALONG CSX RR, CA 0.35 AIR MILE OF JCT OF US 60/N GOSHEN CHURCH RD.	OPEN OAK HICKORY FOREST ON THE HIGHLAND RIM IN KY; ROCKY HILLS AND BARRENS AND ROADSIDE REMNANTS OF THIS HABITAT.
PDONA0B090*002	<i>Ludwigia hirtella</i>	Hairy Ludwigia	GS	S1	E		1897-07	G	H	Edmonson Warren	Bristow Brownsville Rhode Smiths Grove	370714N	0861453W	0511001140 - Dry Prong Springs; (EXACT LOCALITY NOT GIVEN BUT PLOTTED AT SPRINGS ACROSS SR-743 FROM KINSER CEMETERY, SW OF CHALYBEATE).	CHALYBEATE SPRINGS; (EXACT LOCALITY NOT GIVEN BUT PLOTTED AT SPRINGS ACROSS SR-743 FROM KINSER CEMETERY, SW OF CHALYBEATE).		
														0511001220 - Green River/Shanty Hollow Lake			
														0511001230 - Beaverdam Creek			
														0511001240 - Alexander Creek			
														0511001250 - Little Beaverdam Creek			
														0511002190 - Barren River Lake			

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Vascular Plants									
Ecode	SNAME	SCOMNAME	GRANK	SPRNT	SESA	DENT	LASTORS	RREC	DRANK
PDPGL020E0*003	<i>Polygala cruciata</i>	Crossleaf Milkwort	G3	SI	E	1896-07-23	G	H	Edmonson Warren
				Bristow Brownsville Rhoda Smiths Grove			370714N	0861453W	05110001140 - Dr Front 05110001220 - Green River Shanty Hollow Lake 05110001230 - Beaverdam Creek
									CHALYBEATE SPRINGS.
									WET PINELEADS, SAVANNAH PEATS, AND SANDS ON OR NEAR THE COASTAL PLAIN IN KY, SWAMPS, Bogs, EDGE OF LOWLAND WOODS.

Ecode	SNAME	SCOMNAME	GRANK	SPRNT	SESA	DENT	LASTORS	RREC	DRANK	7.5 MINUTE QUADRANGLE	LAT	LONG	EPA WATERBODY	DIRECTIONS	HABITAT
PDAST8L0B0*003	<i>Staphium pinnatifidum</i>	Prairie-dock	G3Q	S3	S	Y	1998-07-06	S	C	Warren	Bristow	370448N	0862147W	05110002190 - Barren River Lake	CA 0.8 RD M. N. OF GIRKIN ON SRD ACROSS FROM PLUM SPRINGS CHURCH.
PDAST8L0B0*003	<i>Staphium pinnatifidum</i>	Prairie-dock	G3Q	S3	S	Y	2000-09-15	S	B	Warren	Bristow	370525N	0862152W	05110002190 - Barren River Lake	FROM KY 1320 AT GIRKIN, FOLLOW GIRKIN RD N CA 1.9 RD, TURN RIGHT ON RALEIGH WILSON RD, FAICH IS ON S SIDE OF RD CA 0.25 RD MILE FROM INTERSECTION,
PDAST8L0B0*006	<i>Staphium pinnatifidum</i>	Prairie-dock	G3Q	S3	S	Y	2001-09-01	S	B	Warren	Bristow	370554N	0862035W	05110002190 - Little Beaverdam Creek	LITTLE BEAVERDAM RD, E SIDE OF RD, CA 0.5 RD M. E. JCT KY 1320.
PDAST8L0B0*010	<i>Staphium pinnatifidum</i>	Prairie-dock	G3Q	S3	S	Y	2001-09-01	S	B	Warren	Bristow	370554N	0862035W	05110002190 - Little Beaverdam Creek	

**Freshwater Mussels**

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Provided to Bernardin, Lochmuller and Associates, Inc.

ECODE	SNAME	SCOMNAME	RANK	GRANK	SPROT	SESAA	SPROT	SESAA	7.5 MINUTE QUADRANGLE	LAT	LONG	EPA WATERBODY	DIRECTIONS	HABITAT		
<b>Freshwater Mussels</b>																
IMBTIV02040*023	<i>Alasmidonta marginata</i>	Elktoe	G4	S2	T	Y	1927-08-26	G	H	Warren	Allen Springs Bowling Green South Drake Polkville	365343N 0862253W	05110002190 - Baren River Lake	DRAKES CREEK, 7.0 MIS OF BOWLING GREEN,	OCCURS IN LARGE TO MEDIUM SIZE STREAMS BUT MORE TYPICAL OF SMALLER STREAMS (BUTCHANAN 1980; GOODRICH AND VAN DER SCHALIE 1944; OESCH 1984; PARMALIE 1967; WILSON AND CLARK 1914). SOMETIMES FOUND IN LAKES CONNECTED TO RIVERS. PARMALIE (1967) REPORTED THE PRE	
IMBTIV02040*041	<i>Alasmidonta marginata</i>	Elktoe	G4	S2	T	Y	1908-12-02	M	H	Warren	Bowling Green North Bowling Green South	370002N 0862544W	05110002190 - Baren River Lake	BARREN RIVER AT BOWLING GREEN,		
IMBTIV10020*006	<i>Cyprogenia stegaria</i>	Fanshell	G1	S1	E	LE	Y	1927-08-27	M	H	Warren	Bowling Green South Polkville	365841N 0862236W	05110002220 - West Fork of Drakes Creek	DRAKES CREEK, 1 MI E OF MT. VICTOR,	MEDIUM TO LARGE STREAMS AND RIVERS WITH MODERATE TO STRONG CURRENT IN COARSE SAND AND GRAVEL AND DEPTH RANGING FROM SHALLOW TO DEEP (GOODRICH AND VAN DER SCHALIE 1944; NEEL AND ALLEN 1964; PARMALIE 1967; JOHNSON 1980; GORDON AND LAYZER 1989).
IMBTIV10020*007	<i>Cyprogenia stegaria</i>	Fanshell	G1	S1	E	LE	Y	1927-08-27	G	H	Warren	Bowling Green South Polkville	365856N 0862204W	05110002190 - Baren River Lake	BARREN R. 4 MI E OF BOWLING GREEN,	

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Provided to Bernardin, Lochmeller and Associates, Inc.

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ECODE	SNAME	SCOMNAME	GRANK	SPROT	SESSA	ENT	LASTOBS	PREC	ERANK
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			COUNTY	7.5 MINUTE QUADRANGLE	LAT	LONG	EPA WATERBODY	DIRECTIONS	HABITAT
<b>Freshwater Mussels</b>									
IMBTIV16111*002	<i>Epioblasma obliquata obliquata</i>	Catspaw	G171	SI E LE Y 1971-07-18 G H	Butler Edmonson Warren	Bowling Green North Bristol Brownsville Reedyville	371007N 086241SW	05110001220 - Green River/Shanty Hollow Lakes	GREEN R AT GLENMORE.
								05110001250 - Little Beaverdam Creek	INHABITS MEDIUM TO LARGE RIVERS IN RUFFLES, SHOALS, AND/OR DEEP WATER IN SWIFT CURRENT (BOGAN AND PARMALEE 1983; PARMALEE 1967, WILSON AND CLARK 1914).
IMBTIV16184*003	<i>Epioblasma torulosa rangiana</i>	Northern Riffleshell	G272	SI E LE Y 1927-08-27 M H	Warren	Bowling Green South Folkville	365814N 086254SW	05110002190 - Barren River Lake	RUFFLES OR SHOALS WITH CURRENT AND SUBSTRATE OF SAND AND/OR GRAVEL IN SMALL TO MODERATE-SIZE RIVERS (CLARKE 1981; WATTERS 1987).
IMBTIV16184*008	<i>Epioblasma torulosa rangiana</i>	Northern Riffleshell	G272	SI E LE Y M H	Warren	Bowling Green North Bowling Green South	370002N 086254NW	05110002190 - Barren River Lake	DRAKES CREEK, 1 MI SE MT VICTOR.
IMBTIV16190*078	<i>Epioblasma triquetra</i>	Snuffbox	G3	SI E Y 1964-07-17 M H	Warren	Bowling Green North Bowling Green South	370002N 086254NW	05110002190 - Barren River Lake	BARREN RIVER, BOWLING GREEN,
								05110002220 - West Fork of Drakes Creek	BARREN RIVER AT KT 31W BRIDGE AT BOWLING GREEN.
									OCCURS IN MEDIUM-SIZED STREAMS TO LARGE RIVERS GENERALLY ON MUD, ROCKY, GRAVEL, OR SAND SUBSTRATES IN FLOWING WATER (BAKER 1928, BUCHANAN 1980, JOHNSON 1978, MURRAY AND LEONARD 1952, PARMALEE 1967). OFTEN DEEPLY BURIED IN SUBSTRATE AND OVERLOOKED BY COLLECTORS.

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Provided to Bernardin, Lachmiller and Associates, Inc.

ECODE	SNAME	SCOMNAME	RANK	SPROT	SESA	DENT	LASTOBS	REC	7.5 MINUTE QUADRANGLE	LAT	LONG	EPA WATERBODY	DIRECTIONS	HABITAT
<b>Freshwater Mussels</b>														
IMBIV16190*097	<i>Epioblasma triquetra</i>	Snuffbox	G3	S1	E	Y	1927-08-24	G	H	Warren	Allen Springs Bowling Green North South Bristol Drake Polkville	365608N 0862332W	03110002190 - Baren River Lake	DRAKES CREEK, 5 MI SE OF BOWLING GREEN.
IMBIV17122*018	<i>Fusconaia subrotunda</i> <i>subrotunda</i>	Longsolid	G3T3	S3	S	Y	1927-	G	H	Warren	Bowling Green North Bowling Green South Bristol Polkville	365836N 0862204W	03110002190 - Baren River Lake	BARREN RIVER, 4 MI E OF BOWLING GREEN.
IMBIV17122*068	<i>Fusconaia subrotunda</i> <i>subrotunda</i>	Longsolid	G3T3	S3	S	Y	1908-11-30	M	H	Warren	Bowling Green North Bowling Green South	370002N 0862544W	03110002190 - Baren River Lake	BARREN RIVER AT BOWLING GREEN.
IMBIV21130*002	<i>Lampsilis ovata</i>	Pocketbook	G5	S1	E	Y	1927-08-27	M	H	Warren	Bowling Green South Polkville	365841N 0862235W	03110002190 - Baren River Lake	DRAKES CREEK, 1.0 MILE OF MOUNT VICTOR.
IMBIV21130*032	<i>Lampsilis ovata</i>	Pocketbook	G5	S1	E	Y	1908-11-30	M	H	Warren	Bowling Green North Bowling Green South	370002N 0862544W	03110002190 - Baren River Lake	BARREN RIVER AT BOWLING GREEN.
<b>Amphibians</b>														
<b>Reptiles</b>														
<b>Birds</b>														
<b>Mammals</b>														
<b>Other</b>														

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ECODE	SNAME	SCOMNAME	CRACK	SPROT	CSESA	DENT	LASTOBS	REC	FORANK	7.5 MINUTE QUADRANGLE	LAT	LONG	EPA WATERBODY	DIRECTIONS	HABITAT		
<b>Freshwater Mussels</b>																	
IMBYV24030*076	<i>Pleurobema cylindrus</i>	Sheepnose	G3	S1	E	Y	M	H	Warren	Bowling Green North Bowling Green South	370002N	0862544W	0511002190 - Barren River Lake	BARREN RIVER, BOWLING GREEN,	USUALLY FOUND IN LARGE RIVERS IN CURRENT ON MUD, SAND, OR GRAVEL BOTTOMS AT DEPTH OF 1.2 METERS OR MORE (BAKER 1928, PARMALEE 1967, GORDON AND LAYERZ 1989),		
IMBYV35060*003	<i>Pleurobema clava</i>	Clubshell	G2	S1	E	LE	Y	1927-08-27	G	H	Warren	Bowling Green North Bowling Green South Bristol Polkville	365856N	0862204W	0511002190 - Barren River Lake 05110002220 - West Fork of Drakes Creek	BARREN R. 4 MI E OF BOWLING GREEN.	THIS SPECIES IS AN INHABITANT OF SMALL STREAMS AND RIVERS (GOODRICH AND VAN DER SCHALIE 1944; ORTMANN 1919-1925). ALTHOUGH IN KENTUCKY IT IS KNOWN FROM MODERATELY LARGE RIVERS, OFTEN DEEPLY BURIED IN THE SUBSTRATE AND CONSEQUENTLY DIFFICULT TO FIND (WATTER
IMBYV35060*040	<i>Pleurobema clava</i>	Clubshell	G2	S1	E	LE	Y	1908-12-02	M	X	Warren	Bowling Green North Bowling Green South	370002N	0862544W	0511002190 - Barren River Lake 05110002220 - West Fork of Drakes Creek	BARREN RIVER AT BOWLING GREEN.	
IMBYV35060*051	<i>Pleurobema clava</i>	Clubshell	G2	S1	E	LE	Y	1927-08-27	M	H	Warren	Bowling Green South Polkville	365814N	0862253W	0511002190 - Barren River Lake 05110002220 - West Fork of Drakes Creek	DRAKES CREEK, 1 MI SE MT VICTOR.	
IMBYV35240*031	<i>Pleurobema plenum</i>	Rough Pigtoe	GI	S1	E	LE	Y	M	H	Warren	Bowling Green North Bowling Green South	370002N	0862544W	0511002190 - Barren River Lake 05110002220 - West Fork of Drakes Creek	BARREN RIVER AT BOWLING GREEN.	MEDIUM TO LARGE RIVERS IN SAND, GRAVEL, AND COBBLE SUBSTRATES (AHLSLETT 1984, BOGAN AND PARMALEE 1983, CLARKE 1981, NEEL AND ALLEN 1964).	
IMBYV39041*007	<i>Quadrula cylindrica</i>	Rabbitfoot	G3T3	S2	T	Y	1927-08-27	G	H	Warren	Bowling Green North Bowling Green South Bristol Polkville	365856N	0862204W	0511002190 - Barren River Lake 05110002220 - West Fork of Drakes Creek	BARREN RIVER 4 MI E OF BOWLING GREEN	SMALL TO LARGE RIVERS WITH SAND, GRAVEL, AND COBBLE AND MODERATE TO SWIFT CURRENT, SOMETIMES IN DEEP WATER (PARMALEE 1967, BOGAN AND PARMALEE 1983).	

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Provided to Bernardin, Lochmuller and Associates, Inc.

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Provided to Bernstein, Lorchmiller and Associates Inc.

ECODE	SNAME	SCOMNAME	RANK	SPROT	DENT	LASTOBS	RREC	COUNTY	7.5 MINUTE QUADRANGLE	LAT	LONG	EPA WATERBODY	DIRECTIONS	HABITAT
<b>Freshwater Mussels</b>														
IMBTIV47070*007	<i>Villosa lenosa</i>	Little Spectaclecase	G5	S3S4	S	1927-08-27	M	H	Warren	Bowling Green South Polkville	365841N	0862236W	05110002220 - West Fork of Drakes Creek	DRAKES CREEK, 1 MI E OF MT VICTOR.
IMBTIV47070*009	<i>Villosa lenosa</i>	Little Spectaclecase	G5	S3S4	S	1927-08-27	G	H	Warren	Bowling Green South Polkville	365856N	0862204W	05110002190 - Barron River Lake	BARREN RIVER 4 MI E OF BOWLING GREEN.
IMBTIV47100*002	<i>Villosa orthmanni</i>	Kentucky Creekshell	G2	S2	T	1927-08-27	M	X	Warren	Bowling Green South Polkville	365841N	0862236W	05110002190 - Barron River Lake	DRAKES CREEK, 1 MI E OF MT. VICTOR.
IMBTIV47100*003	<i>Villosa orthmanni</i>	Kentucky Creekshell	G2	S2	T	1927-08-25	G	H	Warren	Allen Springs Bowling Green South Drake Polkville	365343N	0862253W	05110002190 - Barron River Lake	DRAKES CREEK, 7 MI S BOWLING GREEN.
IMBTIV47100*004	<i>Villosa orthmanni</i>	Kentucky Creekshell	G2	S2	T	1927-08-27	G	X	Warren	Bowling Green North Bristow Polkville	365856N	0862204W	05110002200 - Bay's Fork	BARREN RIVER AT RT 31W BRIDGE AT BOWLING GREEN.
IMBTIV47100*032	<i>Villosa orthmanni</i>	Kentucky Creekshell	G2	S2	T	1964-08-17	M	H	Warren	Bowling Green North Bowing Green South	370002N	0862544W	05110002190 - Barron River Lake	BARREN RIVER AT RT 31W BRIDGE AT BOWLING GREEN.
													05110002220 - West Fork of Drakes Creek	THESE DATA ARE VALID ONLY ON THE DATE ON WHICH THE REPORT WAS GENERATED. THESE DATA MAY ONLY BE USED FOR THE PROJECT NAMED ABOVE.

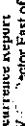
Provided to Bernardin, Loehneller and Associates, Inc.



Fishes	EPCODE	SNAME	SCOMNAME	COUNTY	7.5 MINUTE QUADRANGLE	LAT	LONG	EPA WATERBODY	DIRECTIONS	HABITAT	
AFCJB15010*004		<i>Hypopomus annis</i>	Pallid Shiner	G4	SX	Exit in at ed	Y	1955-07-21	G H	Warren Bowling Green North South Hadley Rockfield	37034N 0862818W 0510002190 - Barren River Lake 0510002220 - West Fork of Drakes Creek 0510002350 - Gasper River
AFCQC04120*011		<i>Percina macrocephala</i>	Longhead Darter	G3	S1	E		1890-	G H	Warren Bowling Green North South Bristow Hadley Polkville Rockfield	37044N 0862509W 0510002190 - Barren River Lake 0510002220 - West Fork of Drakes Creek
AFCQC04120*022		<i>Percina macrocephala</i>	Longhead Darter	G3	S1	E		1890-08-02	G H	Warren Allen Springs Bowling Green North South Bristow Drake Polkville	365606N 0862332W 0510002190 - Barren River Lake 0510002220 - West Fork of Drakes Creek 0510002340 - Trammel Creek
AFCJB10050*011		<i>Phenacobius uranops</i>	Stargazing Minnow	G4	S2S3	S		1890-08-02	G H	Warren Bowling Green North South Bristow Drake Polkville	365606N 0862332W 0510002190 - Barren River Lake 0510002220 - West Fork of Drakes Creek 0510002340 - Trammel Creek
AFCJB30050*018		<i>Phenacobius uranops</i>	Stargazing Minnow	G4	S2S3	S		1890-08-01	G H	Warren Bowling Green North South Bristow Hadley Polkville Rockfield	37034N 0862509W 0510002190 - Barren River Lake 0510002220 - West Fork of Drakes Creek

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KSNPC monitored elements reported for the I-55/US31W Sector East of Bowling Green Project (Warren County)

DR# 04-104\_2mi

I-55/US31W

Sector East of

Bowling Green Project

(Warren County)

Fishes									
EPCODE	SNAME	SCOMNAME	RANK	SPROT	SESEA	DENT	LASTOBS	PREC	EOBANK
									7.5 MINUTE QUADRANGLE
AFCJB310050*021	<i>Phenacobius uranops</i>	Stargazing Minnow	G4	S2S3	S	1970-06-09	G	E	Allen Warren
									Allen Springs Bowling Green South Bristow Meador Polkville
									(HARREN RIVER) 4 MI W CLAYPOOL (PLOTTED 4 MI NW CLAYPOOL), Barren River Lake
									05110002030 - Barren River Bowing Green 05110002190 - Barren River Lake 05110002200 - Bays Fork 05110002220 - West Fork of Drakes Creek
Breeding Birds									
ABPBG07010*016	<i>Thryomanes bewickii</i>	Bewicks Wren	G5	S3B	S	Y	1987-	G	E Warren
									Bowling Green South
									345845N 0862422W
									05110002190 - Barren River Lake 05110002220 - West Fork of Drakes Creek
ABPBG07010*017	<i>Thryomanes bewickii</i>	Bewicks Wren	G5	S3B	S	Y	1989-06-02	S	E Warren
									Bristow
									370444N 0862005W
									05110002190 - Barren River Lake
ABNSA01010*024	<i>Tyto alba</i>	Barn Owl	G5	S3	S	Y	1967-05-16	M	H Warren
									Smiths Grove
									370320N 0861239W
									05110002190 - Barren River Lake
Communities									
CTGRS00050*002	<i>Limestone prairie</i>		GNR	S1	N	Y	2002-09-23	S	X Warren
									Bristow
									370447N 0862148W
									05110002190 - Barren River Lake
									CIRCA 1.0 RD MN NW OF GIRKIN.

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**SENSITIVE ELEMENTS:** Locational information for sensitive plants, animals, and natural communities, if released by the Kentucky State Nature Preserves Commission, may not be released in any document or correspondence. Please refer to the Data License Agreement for a full description of rights and restrictions.

#### Vascular Plants

EPCODE	SNAME	SCOMNAME	GRANK	SPRINT	SESA	SENT	LASTOBS	PERC	COUNTY	75 MINUTE QUADRANGLE	LAT	LONG	EPA WATERBODY	DIRECTIONS	HABITAT
PMLL1A0P0*008	<i>Lilium superbum</i>	Turk's Cap Lily	G5	S1S2	T	Y	1994-07-15	S	D	Warren	Bristol	CONTACT KSNPC	05110001250 - Little Bevverdam Creek	SENSITIVE ELEMENT- CONTACT KSNPC	MOIST MEADOWS, MOIST/WET WOODS, INCLUDING FLOODPLAINS AND COVES
ICMALL1070*035	<i>Oreocetes pelliculus</i>	A Crayfish	G3	S3	S	Y		S	F	Warren	Smiths Grove	CONTACT KSNPC	05110002190 - Barren River Lake	SENSITIVE ELEMENT- CONTACT KSNPC	SUBTERRANEAN WATERS (HOERS 1976).
AMACC01040*023	<i>Myotis grisescens</i>	Gray Myotis	G3	S2	E	LE	1991-10-25	M	F	Edmonson Warren	Bristol	CONTACT KSNPC	05110001240 - Alexander Creek	SENSITIVE ELEMENT- CONTACT KSNPC	
AMACC01040*047	<i>Myotis grisescens</i>	Gray Myotis	G3	S2	E	LE	1996-10-16	S	C	Warren	Smiths Grove	CONTACT KSNPC	05110002190 - Barren River Lake	SENSITIVE ELEMENT- CONTACT KSNPC	
AMACC01100*028	<i>Myotis sodalis</i>	Indiana Bat	G2	S1S2	E	LE	1986-02	S	D	Warren	Smiths Grove	CONTACT KSNPC	05110002190 - Barren River Lake	SENSITIVE ELEMENT- CONTACT KSNPC	

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ERNIE FLETCHER  
GOVERNOR

COMMERCE CABINET  
DEPARTMENT OF FISH & WILDLIFE RESOURCES  
#1 GAME FARM ROAD  
FRANKFORT, KENTUCKY 40601  
PHONE (502) 564-3400 FAX (502) 564-0506  
(800) 858-1549  
[www.kentucky.gov](http://www.kentucky.gov)

W. JAMES HOST  
SECRETARY, COMMERCE CABINET

C. TOM BENNETT  
COMMISSIONER

March 1, 2004

Rusty Yeager  
Bernardin, Lochmueller & Assoc., Inc.  
6200 Vogel Rd.  
Evansville, IN 47715-4006

RE: Threatened/Endangered Species and Critical Habitat Review: I-65/US 31  
Improvement, Item # 3-16.00, Warren County, Kentucky

Dear Mr. Yeager:

The Kentucky Department of Fish and Wildlife Resources (KDFWR) has received your request for the above-referenced information. The Kentucky Fish and Wildlife Information System (KFWIS) indicates that several federally listed species are known to occur within a 10 mile radius of the project area (see attachment). The KFWIS indicates no state listed species with the project area corridor outlined on the provided. Please be aware that our database system is a dynamic one that only represents our current knowledge of the various species distributions.

Based on this information, KDFWR makes the following recommendations.

In counties in which gray bats (*Myotis grisescens*) are known to occur, any cave entrances that exist within the project area (i.e. the right-of-way and regeneration sites) should be surveyed for potential use by gray bats. Because gray bats are cave residents year-round and maternity colonies are generally found in close proximity to rivers, streams and lakes, any caves within the project area could offer potentially valuable habitat to resident gray bats. If a bat survey is necessary, please contact this office at (502) 564-7109 or the US Fish and Wildlife Service office at (502) 695-0468 for information on how to proceed.

In counties in which Indiana bats (*Myotis sodalis*) are known to occur, any wooded areas that may be impacted by the proposed project should be examined for potential Indiana bat habitat. Indiana bats form maternity colonies and roost under the bark of trees in both riparian and upland areas. Therefore, disturbance of trees with exfoliating bark, dead limbs or cavities should be avoided between March 31 and October 15.

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KDWFR does not anticipate any impact to federally listed mussels or the bald eagle (*Haliaeetus leucocephalus*) due to the nature and location of this project.

KDFWR recommends that you look at the appropriate US Department of the Interior National Wetlands Inventory Map to determine where the proposed project may impact wetlands along US I-65/US 31. The appropriate US Army Corps of Engineers office and the Kentucky Division of Water should be contacted before any construction takes place in jurisdictional wetlands.

The proposed project takes place within a karst region of the commonwealth. Due to the sensitive nature of this type of geologic area, certain precautions should be. Care should be taken to protect the ground water from surface releases at all times, any spills should be managed immediately and the proper authorities contacted. Care should also be taken during any excavation not to encroach into subterranean habitat. This habitat type is critical for numerous species including the protected gray bat.

I hope this information proves useful to you. If you have any questions or require additional comment, please call me at the above listed number, extension 366.

Sincerely,



Brad Pendley

Wildlife Biologist

Brad.Pendley@ky.gov

cc: Environmental Section File

deral T&E Within a 10 mile radius of Project Area.

ScientificName	CommonName	QuadName	CountyName	FederalStatus
<i>Haliaeetus leucocephalus</i>	BALD EAGLE	Smiths Grove	WARREN	LT
<i>Epioblasma obliquata obliquata</i>	CATSPAW	Reedyville	WARREN	LE
<i>Epioblasma obliquata obliquata</i>	CATSPAW	Reedyville	BUTLER	LE
<i>Pleurobema clava</i>	CLUBSHELL	Allen Springs	ALLEN	LE
<i>Pleurobema clava</i>	CLUBSHELL	Bowling Green North	WARREN	LE
<i>Pleurobema clava</i>	CLUBSHELL	Bowling Green South	WARREN	LE
<i>Pleurobema clava</i>	CLUBSHELL	Hadley	WARREN	LE
<i>Pleurobema clava</i>	CLUBSHELL	Polkville	WARREN	LE
<i>Pleurobema clava</i>	CLUBSHELL	Reedyville	WARREN	LE
<i>Pleurobema clava</i>	CLUBSHELL	Reedyville	BUTLER	LE
<i>Pleurobema clava</i>	CLUBSHELL	Rhoda	EDMONSON	LE
<i>Cyprogenia stegaria</i>	FANSHELL	Bowling Green North	WARREN	LE
<i>Cyprogenia stegaria</i>	FANSHELL	Bowling Green South	WARREN	LE
<i>Cyprogenia stegaria</i>	FANSHELL	Hadley	WARREN	LE
<i>Cyprogenia stegaria</i>	FANSHELL	Medor	WARREN	LE
<i>Cyprogenia stegaria</i>	FANSHELL	Polkville	WARREN	LE
<i>Cyprogenia stegaria</i>	FANSHELL	Reedyville	WARREN	LE
<i>Cyprogenia stegaria</i>	FANSHELL	Reedyville	BUTLER	LE
<i>Cyprogenia stegaria</i>	FANSHELL	Reedyville	WARREN	LE
<i>Myotis grisescens</i>	GRAY MYOTIS	Bristow	WARREN	LE
<i>Myotis grisescens</i>	GRAY MYOTIS	Brownsville	WARREN	LE
<i>Myotis grisescens</i>	GRAY MYOTIS	Medor	WARREN	LE
<i>Myotis grisescens</i>	GRAY MYOTIS	Smiths Grove	WARREN	LE
<i>Myotis grisescens</i>	GRAY MYOTIS	Smiths Grove	EDMONSON	LE
<i>Myotis sodalis</i>	INDIANA BAT	Smiths Grove	WARREN	LE
<i>Myotis sodalis</i>	INDIANA BAT	Smiths Grove	EDMONSON	LE
<i>Epioblasma torulosa rangiana</i>	NORTHERN RIFFLESHELL	Bowling Green North	WARREN	LE
<i>Epioblasma torulosa rangiana</i>	NORTHERN RIFFLESHELL	Bowling Green South	WARREN	LE
<i>Epioblasma torulosa rangiana</i>	NORTHERN RIFFLESHELL	Hadley	WARREN	LE
<i>Plethobasus cooperianus</i>	ORANGEFOOT PIMPLEBACK	Reedyville	WARREN	LE
<i>Lampsiliis abrupta</i>	PINK MUCKET	Bowling Green North	WARREN	LE
<i>Lampsiliis abrupta</i>	PINK MUCKET	Hadley	WARREN	LE
<i>Lampsiliis abrupta</i>	PINK MUCKET	Reedyville	WARREN	LE
<i>Lampsiliis abrupta</i>	PINK MUCKET	Reedyville	BUTLER	LE
<i>Obovaria retusa</i>	RING PINK	Bowling Green North	WARREN	LE
<i>Obovaria retusa</i>	RING PINK	Hadley	WARREN	LE
<i>Obovaria retusa</i>	RING PINK	Reedyville	WARREN	LE
<i>Obovaria retusa</i>	RING PINK	Reedyville	BUTLER	LE
<i>Pleurobema plenum</i>	ROUGH PIGTOE	Bowling Green North	WARREN	LE
<i>Pleurobema plenum</i>	ROUGH PIGTOE	Hadley	WARREN	LE
<i>Pleurobema plenum</i>	ROUGH PIGTOE	Medor	WARREN	LE
<i>Pleurobema plenum</i>	ROUGH PIGTOE	Reedyville	BUTLER	LE
<i>Pleurobema plenum</i>	ROUGH PIGTOE	Reedyville	WARREN	LE





ERNIE FLETCHER  
GOVERNOR

ENVIRONMENTAL AND PUBLIC PROTECTION CABINET  
DEPARTMENT FOR ENVIRONMENTAL PROTECTION  
DIVISION OF WATER  
14 REILLY ROAD  
FRANKFORT, KENTUCKY 40601-1190  
[www.kentucky.gov](http://www.kentucky.gov)

LAJUANA S. WILCHER  
SECRETARY

10 March 2004

Mr. Rusty Yeager  
Bernardin-Lochmueller and Associates, Inc.  
6200 Vogel Road  
Evansville, Indiana 47715-4006

Re: Water quality data request for area of the I-65 to US 31W Connector in Warren County,  
Kentucky

Dear Mr. Yeager:

The area of this project is karst and a classic sinkhole plain formed from St. Louis Limestone. This area has the densest population of sinkholes found in Kentucky. The area of this connector lies in the Graham Springs karst groundwater basin, with a low flow of about 20 cfs. During low flow, this spring contributes about 10 percent of the flow of the Barren River; thus, a very important part of the larger aquatic system. This connection to the Barren River is just upstream of a designated segment of Outstanding State Resource Water (OSRW) as designated by 401 KAR 5:026. This OSRW is from Barren River mile 0.0 (mouth) to 15.0 in Warren County. This section of river supports two mussel species (*Cyprogenia stegari* and *Pleurobema plenum*) that are USFWS listed Endangered. Protection of these mussel populations is of paramount interest.

I am enclosing water quality data on Wilkins Blue Hole that is hydrologically connected to Graham Springs. This sample point is located downstream from the project area.

If you have further questions, please contact me at: 502-564-3410, extension 497. For questions concerning the water quality data enclosed, or specific sampling information, please contact Joe Ray at the above number, extension 644.

Sincerely,

Randall G. Payne, Supervisor  
Standards and Specifications Section  
Water Quality Branch

cc: file

Enclosures: Water quality data from Wilkins Blue Hole

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**WATERWORKS SPRING GROUNDWATER BASIN  
NON-POINT SOURCE STUDY  
WARREN COUNTY, KENTUCKY**

**Project #: 09  
Grant #: 994339930**

Submitted By:  
**Jack R. Moody, Joseph A. Ray, David P. Leo**  
**Groundwater Branch**  
**Kentucky Division of Water**  
**14 Reilly Rd**  
**Frankfort, Kentucky 40601**

**April 4, 2000**

Wilkins Blue Hole 1994

3DI = Below Detection Limit

Below Detection Limit

Blank space = Not Sample

NA = Not Analyzed  
Pesticides shown are only those actually detected during study.

# Wilkins Blue Hole 1995

Parameter	Sample Type	Value	Unit	Sample Date	Comments
Alkalinity		180.0000	123.0000	191.0000	224.0000
Bioologic Oxygen Demand		1.9000	1.6000	0.0000	0.1000
Chloride		5.8000	3.5000	5.6000	5.8000
Conductivity ( $\mu\text{mho/cm}$ )		413.0000	306.0000	425.0000	483.0000
Total Suspended Solids		13.0000	95.0000	9.0000	8.0000
Total Dissolved Solids		216.0000	170.0000	248.0000	268.0000
Sulfate		10.5000	8.0000	12.8000	284.0000
Organic Carbon		0.5000	3.6000	0.8000	10.9000
Ammonia-Nitrogen		BDL	0.0540	BDL	BDL
Total Kjeldhal Nitrogen		BDL	0.4640	BDL	BDL
Nitrate		3.6700	3.8400	3.6000	3.7500
Ortho-Phosphorus		0.0240	0.1290	0.0310	0.0350
Total Dissolved Phosphorus		0.0280	0.1550	0.0410	0.0340
Total Phosphorus		0.0450	0.2900	0.0430	0.0460
Calcium		67.0000	49.1000	74.8000	78.6000
Magnesium		9.7500	5.8500	10.2000	11.5000
Potassium		1.6600	3.1900	2.0700	1.6800
Sodium		3.2300	1.9100	2.7200	2.8500
Iron		BDL	0.0690	BDL	BDL
Silica		8.1000	6.3000	8.6100	9.6100
Aalachlor ( $\mu\text{g/liter}$ )		BDL	BDL	BDL	BDL
Atrazine ( $\mu\text{g/liter}$ )		BDL	5.1000	0.3400	0.6600
Bromacil ( $\mu\text{g/liter}$ )		BDL	BDL	BDL	BDL
Cyanazine ( $\mu\text{g/liter}$ )		BDL	0.6500	BDL	BDL
Dalapon ( $\mu\text{g/liter}$ )		BDL	BDL	BDL	BDL
Malathion ( $\mu\text{g/liter}$ )		BDL	0.0250	BDL	BDL
Metolachlor ( $\mu\text{g/liter}$ )		BDL	0.7300	BDL	BDL
Simazine ( $\mu\text{g/liter}$ )		BDL	0.3800	0.0710	0.0520
2,4 D ( $\mu\text{g/liter}$ )		BDL	BDL	BDL	BDL
Fecal Coliform (colonies/100ml)		545.0000	25.0000	327.0000	18.0000
		20,000.0000	20,000.0000	117.0000	46.0000
				45.0000	200.0000
					182.0000
					164.0000

BDL = Below Detection Limits

Blank Space = Not Sampled

NA = Not Analyzed  
Pesticides shown are only those actually detected during study.  
All results in milligrams/liter (mg/l) unless otherwise noted.

# Wilkins Blue Hole 1996

	Sample Date	Temp (°C)	pH	TDS	DO	Alkalinity	Chloride	Conductivity (µmho/cm)	Sulfate	Total Dissolved Solids	Total Suspended Solids	Oil and Grease	BOD	TOC	Ammonia-Nitrogen	Nitrate	Total Kjeldhal Nitrogen	Ortho-Phosphorus	Total Dissolved Phosphorus	Total Phosphorus	Aalachlor (ug/liter)	Atrazine (ug/liter)	Bromacil (ug/liter)	Cyanazine (ug/liter)	Dalapon (ug/liter)	Malathion (ug/liter)	Metolachlor (ug/liter)	Simazine (ug/liter)	2,4 D (ug/liter)	Fecal Coliform (Colonies/100ml)
Alkalinity	184.0000	171.0000	158.0000	160.0000	154.0000	161.0000	195.0000	224.0000	217.0000	227.0000	215.0000	215.0000	215.0000	194.0000	194.0000	194.0000	194.0000	194.0000	194.0000	194.0000	194.0000	194.0000	194.0000	194.0000	194.0000	194.0000	194.0000	194.0000		
Calcium	59.4000	69.0000	58.4000	55.9000	60.5000	61.5000	69.5000	77.9000	77.8000	80.0000	75.3000	75.3000	75.3000	75.3000	75.3000	75.3000	75.3000	75.3000	75.3000	75.3000	75.3000	75.3000	75.3000	75.3000	75.3000	75.3000				
Iron	0.0060	BDL	BDL	BDL	BDL	0.0230	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL			
Magnesium	8.0800	9.1000	8.0100	7.4400	7.1800	8.2100	9.1900	10.5000	10.9000	10.6000	10.9000	10.6000	10.6000	10.6000	10.6000	10.6000	10.6000	10.6000	10.6000	10.6000	10.6000	10.6000	10.6000	10.6000	10.6000	10.6000	10.6000			
Potassium	1.8000	1.4600	1.4200	1.2000	1.6300	2.4200	3.4100	2.1700	3.1500	2.3700	2.3700	2.3700	2.3700	2.3700	2.3700	2.3700	2.3700	2.3700	2.3700	2.3700	2.3700	2.3700	2.3700	2.3700	2.3700	2.3700	2.3700			
Silica	7.9600	8.3100	8.5700	8.7200	8.6000	8.8300	9.6500	10.1000	9.5100	9.8500	10.2000	9.7400	9.7400	9.7400	9.7400	9.7400	9.7400	9.7400	9.7400	9.7400	9.7400	9.7400	9.7400	9.7400	9.7400	9.7400	9.7400			
Sodium	3.9100	3.0100	2.4300	2.4900	2.3100	2.2900	2.6200	2.6200	2.6200	2.6200	2.6200	2.6200	2.6200	2.6200	2.6200	2.6200	2.6200	2.6200	2.6200	2.6200	2.6200	2.6200	2.6200	2.6200	2.6200	2.6200				
Chloride	9.3000	8.2000	7.0000	7.1000	6.6000	6.0000	6.8100	6.7000	7.2000	7.1000	6.8000	6.5000	6.5000	6.5000	6.5000	6.5000	6.5000	6.5000	6.5000	6.5000	6.5000	6.5000	6.5000	6.5000	6.5000	6.5000	6.5000			
Conductivity (µmho/cm)	398.0000	401.0000	349.0000	376.0000	361.0000	365.0000	427.0000	427.0000	427.0000	469.0000	485.0000	470.0000	470.0000	470.0000	470.0000	470.0000	470.0000	470.0000	470.0000	470.0000	470.0000	470.0000	470.0000	470.0000	470.0000	470.0000				
Sulfate	10.9000	11.5000	0.0000	7.4000	5.1000	6.0000	BDL	8.1000	7.6000	8.1000	8.1000	8.1000	8.1000	8.1000	8.1000	8.1000	8.1000	8.1000	8.1000	8.1000	8.1000	8.1000	8.1000	8.1000	8.1000	8.1000				
Total Dissolved Solids	226.0000	210.0000	216.0000	219.0000	230.0000	260.0000	274.0000	274.0000	274.0000	278.0000	291.0000	272.0000	272.0000	272.0000	272.0000	272.0000	272.0000	272.0000	272.0000	272.0000	272.0000	272.0000	272.0000	272.0000	272.0000	272.0000				
Total Suspended Solids	6.0000	13.0000	12.0000	11.0000	9.0000	20.0000	77.0000	77.0000	77.0000	14.0000	25.0000	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL			
Oil and Grease																														
Biologic Oxygen Demand	0.4000	0.7000	0.6000	0.7000	0.4000	BDL	2.6000	0.2000	0.5000	0.5000	0.6000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000			
Organic Carbon	0.8800	0.6000	0.5000	0.5000	0.4000	0.5000	1.0000	1.4000	1.1000	0.6000	1.6000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000			
Ammonia-Nitrogen	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.0870	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL			
Nitrate	3.8900	3.8800	3.8200	4.3000	4.0700	3.6100	4.1000	3.6000	3.4700	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000			
Total Kjeldhal Nitrogen	0.5600	0.6690	BDL	BDL	0.9690	0.3590	1.2500	0.1080	0.5910	0.2920	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL		
Ortho-Phosphorus	0.0330	0.0500	0.0430	0.0340	0.0340	0.0280	0.0710	0.0190	0.0650	0.0160	0.0460	0.0320	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400	0.0400		
Total Dissolved Phosphorus	0.0280	0.0270	0.0280	0.0360	0.0340	0.0310	0.0310	0.0370	0.1420	0.0290	0.0810	0.0730	0.0270	0.0270	0.0270	0.0270	0.0270	0.0270	0.0270	0.0270	0.0270	0.0270	0.0270	0.0270	0.0270	0.0270	0.0270			
Total Phosphorus																														
Aalachlor (ug/liter)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL			
Atrazine (ug/liter)	BDL	0.0430	BDL	0.0710	0.0420	0.05920	0.05920	0.05920	0.05920	0.05920	0.05920	0.05920	0.05920	0.05920	0.05920	0.05920	0.05920	0.05920	0.05920	0.05920	0.05920	0.05920	0.05920	0.05920	0.05920	0.05920	0.05920			
Bromacil (ug/liter)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL			
Cyanazine (ug/liter)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL			
Dalapon (ug/liter)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL			
Malathion (ug/liter)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL			
Metolachlor (ug/liter)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL			
Simazine (ug/liter)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL			
2,4 D (ug/liter)	BDL	BDL	BDL	BDL	BDL	0.0940	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL			
Fecal Coliform (Colonies/100ml)	1,200.0000	731300	387.0000	500.0000	591.0000	324.0000	171.0000	218.0000	4,800.0000	500.0000	2,500.0000	500.0000	2,500.0000	500.0000	2,500.0000	500.0000	2,500.0000	500.0000	2,500.0000	500.0000	2,500.0000	500.0000	2,500.0000	500.0000	2,500.0000	500.0000	2,500.0000			

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ERNIE FLETCHER  
GOVERNOR

LAJUANA S. WILCHER  
SECRETARY



103-0111-OPL

ENVIRONMENTAL AND PUBLIC PROTECTION CABINET  
DEPARTMENT FOR NATURAL RESOURCES

DIVISION OF FORESTRY  
LEAH W. MACSWORDS, DIRECTOR  
627 COMANCHE TRAIL  
FRANKFORT, KENTUCKY 40601

March 15, 2004

Rusty Yeager, Environmental Biologist  
Bernardin-Lochmueller and Associates, Inc.  
6200 Vogel Road  
Evansville, Indiana 47715-4006

Dear Mr. Yeager:

Re: I-65 to US 31-W Connector in Warren County, Kentucky  
Kentucky Transportation Cabinet Item Number 3-16.00

Thank you for the opportunity to add input to your ecological assessment of the proposed connector roadway between I-65 and US 31-W in Warren County.

Our response is based on aerial observations on February 28, ground reconnaissance on March 12, and several years of forest management work in Warren County. The area in question is a lightly forested karst plain and is used primarily for agriculture. We know of no Tree Farms, Stewardship Forests, or State Champion trees in the study area.

We did note a significant woodland in the area. There is a fairly mature forest in and around a karst window/cave at Lat. 37.02289 and Long. 86.31391 near the community of Sunnyside. The karst feature is called Mill Cave and according to a local resident contains a large underground stream. There is a gauging well adjacent to Mill Cave, which, according to the same local resident, is operated by the National Park Service. What appears to be the staked centerline of the proposed roadway is within 100 feet of the sink containing Mill Cave.

Every effort should be made to ensure that the woodland around the karst feature is left intact and enhanced to provide filtering of highway runoff water entering the underground drainage system at this point. State acquisition might provide the best solution to ensure protection of the karst feature and the associated forest.

We appreciate the opportunity to comment on this project and will be glad to provide further assistance if needed. If you have questions, please contact Steve Gray, district forester in our Elizabethtown office, at (270) 766-5010.

Sincerely,

A handwritten signature in black ink, appearing to read "Leah W. MacSwords".  
Leah W. MacSwords  
Director

RECEIVED

MAR 18 2004

BLA

